

(2) AMENDED CLAIMS

1. (Currently Amended) A process for preparing olefinic living polymers comprising polymerizing an olefinic monomer having 2 to 20 carbon atoms at a polymerization temperature of -20 to -100°C in the presence of a catalyst comprising:

(A-1) a hafnium-containing compound having one or two cyclopentadienyl backbones, and

(B) a borane compound (B-1) of the formula (I):



wherein Ph is a phenyl group which may be substituted, ~~or~~

~~a borate compound (B-2) of the formula (II):~~



~~wherein Ph is as defined above and X⁺ is a cation,~~ to produce a polymer having a molecular weight distribution (Mw/Mn) of 1 to 1.3.

2. (Currently Amended) A process for preparing olefinic living polymers comprising polymerizing an olefinic monomer having 2 to 20 carbon atoms at a polymerization temperature of -20 to -100°C in the presence of a catalyst comprising:

(A-1) a hafnium-containing compound having one or two cyclopentadienyl backbones,

(B) a borane compound (B-1) of the formula (I):



wherein Ph is a phenyl group which may be substituted, ~~or~~

~~a borate compound (B-2) of the formula (II):~~



~~wherein Ph is as defined above and X⁺ is a cation, and~~

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(C) an aluminum compound of the formula (III):



wherein R is a hydrocarbon group having 4 to 20 carbon atoms, Y is a halogen atom, an alkoxyl group, a trialkylsiloxy group, a ~~di(trialkylsilyl)amino~~ bis(trialkylsilyl)amino group or a trialkylsilyl group, and n is 0, 1 or 2, to produce a polymer having a molecular weight distribution (Mw/Mn) of 1 to 1.3.

3. (Original) The process of Claim 1 or 2, wherein said polymerization temperature is from -30 to -80°C.

4. (Original) The process of Claim 1 or 2, wherein said polymerization temperature is from -40 to -80°C.

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5. (Currently Amended) A process for preparing olefinic living polymers comprising polymerizing an olefinic monomer having 2 to 20 carbon atoms at a polymerization temperature of -60 to -100°C in the presence of a catalyst comprising:

(A-2) a zirconium-containing compound having one or two cyclopentadienyl backbones, and

(B) a borane compound (B-1) of the formula (I):



wherein Ph is a phenyl group which may be substituted, ~~or~~

~~a borate compound (B-2) of the formula (II):~~



~~wherein Ph is as defined above and X⁺ is a cation, to produce a polymer having a molecular weight distribution (Mw/Mn) of 1 to 1.3.~~

6. (Currently Amended) A process for preparing olefinic living

polymers comprising polymerizing an olefinic monomer having 2 to 20 carbon atoms at a polymerization temperature of -60 to -100°C in the presence of a catalyst comprising:

(A-2) a zirconium-containing compound having one or two cyclopentadienyl backbones,

(B) a borane compound (B-1) of the formula (I):



wherein Ph is a phenyl group which may be substituted, ~~or~~

~~a borate compound (B-2) of the formula (II):~~



~~wherein Ph is as defined above and X⁺ is a cation, and~~

(C) an aluminum compound of the formula (III):



wherein R is a hydrocarbon group having 4 to 20 carbon atoms, Y is a halogen atom, an alkoxyl group, a trialkylsiloxy group, a ~~di(trialkylsilyl)amino~~ bis(trialkylsilyl)amino group or a trialkylsilyl group, and n is 0, 1 or 2, to produce a polymer having a molecular weight distribution (Mw/Mn) of 1 to 1.3.

7. (Original) The process of Claim 5 or 6, wherein said polymerization temperature is from -60 to -80°C.

8. (Original) A process for preparing olefinic living polymers comprising polymerizing an olefinic monomer having 2 to 20 carbon atoms at a polymerization temperature of -20 to -100°C in the presence of a catalyst comprising:

(A-2) a zirconium-containing compound having one or two cyclopentadienyl backbones,

(B) a borane compound (B-1) of the formula (I):



wherein Ph is a phenyl group which may be substituted, or
a borate compound (B-2) of the formula (II):



wherein Ph is as defined above and X^+ is a cation, and
(D) a titanium-containing compound.

9. (Currently Amended) A process for preparing olefinic living polymers comprising polymerizing an olefinic monomer having 2 to 20 carbon atoms at a polymerization temperature of -20 to -100°C in the presence of a catalyst comprising:

(A-2) a zirconium-containing compound having one or two cyclopentadienyl backbones,

(B) a borane compound (B-1) of the formula (I):

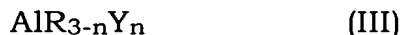


wherein Ph is a phenyl group which may be substituted, or
a borate compound (B-2) of the formula (II):



wherein Ph is as defined above and X^+ is a cation,

(C) an aluminum compound of the formula (III):



wherein R is a hydrocarbon group having 4 to 20 carbon atoms, Y is a halogen atom, an alkoxyl group, a trialkylsiloxy group, a ~~di(trialkylsilyl)amino~~ bis(trialkylsilyl)amino group or a trialkylsilyl group, and n is 0, 1 or 2, and

(D) a titanium-containing compound.

10. (Original) The process of Claim 8 or 9, wherein said titanium-containing compound is a titanium-containing compound having

one cyclopentadienyl backbone.

11. (Currently Amended) The process of Claim ~~8, 9 or 10~~ 8 or 9, wherein at least one of said zirconium-containing compound having one or two cyclopentadienyl backbones (A-2) and said titanium-containing compound (D) contains an alkyl group.

12. (Currently Amended) The process of ~~any of Claims 8 to 11~~ Claim 8 or 9, wherein said polymerization temperature is from -30 to -80°C.

13. (Currently Amended) The process of ~~any of Claims 8 to 11~~ Claim 8 or 9, wherein said polymerization temperature is from -40 to -60°C.

14. (Currently Amended) The process of any of Claims ~~1 to 13~~ 1, 2, 5, 6, 8 and 9, wherein Ph group in said formula (I) or (II) is a group substituted by 1 to 5 fluorine atoms.

15. (Currently Amended) The process of any of Claims ~~1 to 13~~ 1, 2, 5, 6, 8 and 9, wherein Ph group in said formula (I) or (II) is a group substituted by five fluorine atoms.

16. (Currently Amended) The process of ~~any of Claims 2 to 4, 6, 7 and 9 to 15~~ Claim 2, 6 or 9, wherein n in said formula (III) is 0.

17. (Currently Amended) The process of ~~any of Claims 2 to 4, 6, 7 and 9 to 15~~ Claim 2, 6 or 9, wherein in said formula (III) n is 0 and R is an alkyl group having 4 to 8 carbon atoms.

18. (Currently Amended) The process of any of Claims ~~1 to 17~~ 1,

2, 5, 6, 8 and 9, wherein said olefinic monomer is an α -olefin having 2 to 20 carbon atoms.

19. (Currently Amended) The process of any of Claims ~~1 to 17~~ 1, 2, 5, 6, 8 and 9, wherein said olefinic monomer is an α -olefin having 2 to 10 carbon atoms.

20. (Currently Amended) The process of any of Claims ~~1 to 17~~ 1, 2, 5, 6, 8 and 9, wherein said olefinic monomer is an α -olefin having 3 to 6 carbon atoms.

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Curled 21. (Currently Amended) The process of any of Claims ~~1 to 20~~ 1, 2, 5, 6, 8 and 9, wherein said polymerizing is carried out under the condition that the produced polymer is not precipitated.

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08/19/03 22. (Currently Amended) The process of any of Claims ~~1 to 21~~ 1, 2, 5, 6, 8 and 9, wherein ~~said~~ ^{the} molecular weight distribution is from 1 to 1.2.
